

We claim:

1. An Open Shortest Path Found (OSPF) packet of an OSPF protocol used in a network having a plurality of nodes connected by optical links, the OSPF packet comprising an opaque
5 Link State Advertisement (LSA), the LSA including:
 - an LSA header having a single Vendatt Link State Identification (ID) field instead of the Opaque Type and the Type-Specific ID fields of a standard LSA header; and
 - a set of Vendor Attribute Type/Length/Value (TLV) fields, the Value field including an Enterprise Code field and a Vendatt-Data section, and the Type field being a Vendatt-Type field
10 indicating the presence of the Enterprise Code field in the Value field;
 - the Vendatt Link State ID field of the LSA header indicating the presence of the set of Vendor Attribute TLV fields.
2. An OSPF packet as described in claim 1, wherein the Vendatt Link State ID field of the
15 LSA header has a numerical value, which is designed not to conflict with the numerical values of the Opaque Type and the Type-Specific ID fields of a standard LSA header.
3. An OSPF packet as described in claim 2, wherein the numerical value of the Vendatt Link
20 State ID field indicates the presence of Vendor specific link related information in the Vendatt-Data section of the set of Vendor Attribute TLV fields.
4. An OSPF packet as described in claim 2, wherein the numerical value of the Vendatt Link
25 State ID field indicates the presence of Vendor specific node related information in the Vendatt-Data section of the set of Vendor Attribute TLV fields.
5. An OSPF packet as described in claim 3, wherein the Vendor specific link related information is a wavelength division multiplexing (WDM) link related information comprising one or more of the following:

frequencies of dither tones (a wavekey) modulated onto a wavelength of the WDM link;
a location field listing the physical shelf, card slot, and port location of the node
terminating the WDM link;
a wavelength identifier of the wavelength of the WDM link;
5 a path name (trail name) assigned to the wavelength of the WDM link;
a direction of the WDM link; and
a working state of the wavelength of the WDM link.

6. An OSPF packet as described in claim 5, wherein the Vendatt-Data section comprises a
sub-TLV field, the sub-TLV field comprising a sub-sub set of Vendor Attribute TLV fields,
10 which contains said Vendor specific link related information.

7. An OSPF packet as described in claim 4, wherein the Vendor specific node related
information comprises one or more of the following:
a Node Name which includes a text string bearing the name of the node; and
a Software Version which includes a text string characterizing the current software load of
15 the node.

8. An OSPF packet as described in claim 7, wherein the Vendatt-Data section comprises a
sub-TLV field, the sub-TLV field comprising a sub-sub set of Vendor Attribute TLV fields,
which contains said Vendor specific node related information.

9. An OSPF packet as described in claim 8, wherein the sub-TLV field comprises an
20 Advertising Router ID field.

10. A protocol for distributing vendor specific information for a WDM optical network based
on the Open Shortest Path Found (OSPF) protocol, wherein the OSPF protocol is extended to
provide an OSPF packet, the OSPF packet comprising an opaque Link State Advertisement
(LSA), the LSA including:

25 an LSA header having a single Vendatt Link State Identification (ID) field instead of the
Opaque Type and the Type-Specific ID fields of a standard LSA header; and

a set of Vendor Attribute Type/Length/Value (TLV) fields, the Value field including an Enterprise Code field and a Vendatt-Data section, and the Type field being a Vendatt-Type field indicating the presence of the Enterprise Code field in the Value field;

5 the Vendatt Link State ID field of the LSA header indicating the presence of the set of Vendor Attribute TLV fields.

11. A protocol as described in claim 10, wherein the Vendatt Link State ID field of the LSA header has a numerical value, which is designed not to conflict with the numerical values of the Opaque Type and the Type-Specific ID fields of a standard LSA header.

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12. A protocol as described in claim 11, wherein the numerical value of the Vendatt Link State ID field indicates the presence of Vendor specific link related information in the Vendatt-Data section of the set of Vendor Attribute TLV fields.

15 13. A protocol as described in claim 11, wherein the numerical value of the Vendatt Link State ID field indicates the presence of Vendor specific node related information in the Vendatt-Data section of the set of Vendor Attribute TLV fields.

20 14. A protocol as described in claim 12, wherein the Vendor specific link related information is a wavelength division multiplexing (WDM) link related information comprising one or more of the following:

25 frequencies of dither tones (a wavekey) modulated onto a wavelength of the WDM link;
a location field listing the physical shelf, card slot, and port location of the node terminating the WDM link;
a wavelength identifier of the wavelength of the WDM link;
a path name (trail name) assigned to the wavelength of the WDM link;
a direction of the WDM link; and
a working state of the wavelength of the WDM link.

15. A protocol as described in claim 14, wherein the Vendatt-Data section comprises a sub-TLV field, the sub-TLV field comprising a sub-sub set of Vendor Attribute TLV fields, which contains said Vendor specific link related information.
- 5 16. A protocol as described in claim 13, wherein the Vendor specific node related information comprises one or more of the following:
- a Node Name which includes a text string bearing the name of the node; and
 - a Software Version which includes a text string characterizing the current software load of the node.
- 10 17. A protocol as described in claim 16, wherein the Vendatt-Data section comprises a sub-TLV field, the sub-TLV field comprising a sub-sub set of Vendor Attribute TLV fields, which contains said Vendor specific node related information.
18. A protocol as described in claim 17, wherein the sub-TLV field comprises an Advertising Router ID field.
- 15 19. A method for distributing wavelength identification information for a WDM optical network using a known routing protocol, where the known routing protocol is extended to provide a packet for transmitting vendor specific information related to wavelength identification, the packet comprising a Vendatt-type field, a Vendatt-length field, an Enterprise Code field, and a Vendatt-data section, wherein the Vendatt-Data section includes the
- 20 wavelength identification information to be distributed.
20. The method described in claim 19, wherein the known routing protocol is the OSPF protocol, and the packet includes a Link State Advertisement (LSA), comprising a set of Type/Length/Value (TLV) fields including said Vendatt-type, Vendatt-length, Enterprise Code
- 25 fields, and the Vendatt-data section.
21. A WDM optical network, using a protocol for distributing wavelength identification information for the WDM optical network, the protocol being based on a known routing

protocol, which is extended to provide a packet for transmitting vendor specific information related to wavelength identification, the packet comprising a Vendatt-type field, a Vendatt-length field, an Enterprise Code field, and a Vendatt-data section, wherein the Vendatt-Data section includes the wavelength identification information to be distributed.

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22. The network as described in claim 21, wherein the known routing protocol is OSPF, and the packet includes a Link State Advertisement (LSA), comprising a set of Type/Length/Value (TLV) fields, including said Vendatt-type, Vendatt-length, Enterprise Code fields, and the Vendatt-data section.

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